

*North Carolina.*—Murphy, 9; Highland, 8; Ore Knob, 7.50; Weldon, 5; Chapel Hill, 4.50.

*Ohio.*—New Athens, 16.25; North Lewisburg, 16; Columbus, about 13; College Hill, 12; Canal Dover, 10; Marion, 7.50; Ruggles, 7; Toledo, 6.50; Cleveland, 6; Westerville, 5; Bethel, 4.

*Oregon.*—Eola, 4.50.

*Pennsylvania.*—Grampian Hills, 25; Wellsboro, 21.75; Erie, 15.50; Germantown, 15.50; Dyberry, 14; Fallsington, 14; Philadelphia, 13.50; Catawissa, 12.75; Williamsport, 12.50; Chambersburg, 11.75; Pittsburg, 10; West Chester, 10.

*Rhode Island.*—Newport, 12.

*Tennessee.*—Knoxville, 6; Chattanooga, 3.50; Austin, 3.25.

*Utah.*—Corinne, 10; Salt Lake City, 10; Ogden, 7; Promontory, 5.

*Vermont.*—Strafford, 36; Lunenburg, 20.50; Newport, 14; Charlotte, 8.

*Virginia.*—Johnsontown, 13; Lynchburg, 9.25; Variety Mills, 9.25; Accotink, 9.25; Norfolk, 8.50.

*West Virginia.*—Helvetia, 21; Morgantown, about 17.

*Wisconsin.*—Neillsville, 32.50; Embarrass, 28.50; Franklin, 28; Manitowoc, 24.25; Milwaukee, 16.50; Ripon, 16.50; Beloit, 15; La Crosse, 13.50; Madison, about 10.

*Wyoming.*—Cheyenne, 8.75.

#### DEPTH OF UNMELTED SNOW ON GROUND AT END OF MONTH.

[Expressed in inches.]

*California.*—Cape Mendocino, trace.

*Colorado.*—Pike's Peak, 4; West Las Animas, 1.25.

*Connecticut.*—Southington, 2; New London, trace.

*Dakota.*—Fort Stevenson, 10; Wicklow, 4.30; Bismarck, 4; Huron, 2; Morrilton, 2; Alexandria, 1.80; Fort Bennett, trace.

*Idaho.*—Eagle Rock, 7.

*Illinois.*—Riley, 18; Morrison, 10; Peoria, 10; Champaign, trace; Chicago, trace; Springfield, trace.

*Indiana.*—Logansport, 3.35; Monticello, 1; Lafayette, 0.50; Indianapolis, trace; Wabash, trace.

*Iowa.*—Independence, from 6 to 10; Humboldt, 20.6; Ames, 20; Cresco, 18; Des Moines, 14; Indianola, 14; Monticello, 11; Guttenburg, 10; Muscatine, 8.50; Cedar Rapids, about 8; Dubuque, 6; Clinton, 5; Des Moines, 3; Keokuk, 2; Davenport, 1.

*Kansas.*—Pretty Prairie, 2.

*Maine.*—Gardiner, 19; Orono, 14; Eastport, 11; Portland, 4.

*Maryland.*—Emmitsburg, about 3; Baltimore, trace; Sandy Springs, trace.

*Massachusetts.*—Mendon, 3; Westborough, 3; Charlestown, 1; Somerset, trace.

*Michigan.*—Northport, 53; Traverse City, 30; Hastings, 28; Marquette, 28; Mackinac City, 18; Grand Haven, 8.50; Alpena, 6; Escanaba, 6; Lansing, 5; Thornville, 5; Hillsdale, 4; Litchfield, 3; Port Huron, trace.

*Minnesota.*—Saint Paul, 19; Moorhead, 16; Duluth, 14; Saint Vincent, 7.

*Missouri.*—Bedford, 1.

*Montana.*—Fort Assinniboine, 12; Fort Keogh, 10; Billings, 9; Helena, 6; Fort Missoula, 4; Fort Shaw, 2; Fort Benton, 1.50.

*Nebraska.*—North Platte, 6; De Soto, 5; Genoa, 3; Lincoln, 3; Omaha, trace; Utica, trace.

*New Hampshire.*—Mount Washington, 24; Grafton, 23; New Market, 4.50.

*New Jersey.*—Atlantic City, trace; Bordentown, trace; Freehold, trace; Paterson, trace.

*New Mexico.*—Santa Fé, trace to 6.

*New York.*—Palermo, 25; Oswego, 11; Cooperstown, 8; Factoryville, 3; Penn Yan, 3; Buffalo, 2; Rochester, 2; Albany, 1; Flushing, 1.

*Ohio.*—Canal Dover, trace to 3; New Athens, 1.50; Bethel, 0.50; Cleveland, 0.50; Toledo, 0.50; North Lewisburg, trace; Sandusky, trace.

*Oregon.*—Umatilla, 7.

*Pennsylvania.*—Grampian Hills, 14; Wellsborough, 14; Dyberry, 10; Erie, 6; Chambersburg, 5.50; State College, 4; Williamsport, 4; Catawissa, 3; West Chester, 2.

*Vermont.*—Strafford, 36; Woodstock, 27.

*Washington Territory.*—Olympia, 1.50.

*West Virginia.*—Helvetia, 3.

*Wisconsin.*—Embarrass, 42; Neillsville, 28; Franklin, 24; Ripon, 17; Beloit, 12; La Crosse, 12; Madison, 7; Milwaukee, 4.

*Wyoming.*—Cheyenne, 24.

The figures given above are as reported by the observers.

#### SNOW FROM A CLOUDLESS SKY.

Burlington, Vermont, 5th, 6th, 8th, 9th. Springfield, Illinois, 8th, light snow fell during the night, and continued until 7.15 a. m. The clouds disappeared at 6.20 a. m., leaving the sky with a hazy appearance from which snow continued to fall. Wicklow, Dakota, 28th, snow fell from a cloudless sky from 8.15 to 8.40 p. m.

#### SLEET.

*Alabama.*—Green Spring, 21st.

*Arizona.*—Fort Verde, 19th.

*Arkansas.*—Fort Smith, 15th, 19th; Little Rock, 15th, 20th.

*Connecticut.*—New Haven, 17th.

*Georgia.*—Quitman, 22d.

*Illinois.*—Cairo, 19th, 20th; Champaign, 20th; Chicago, 12th, 13th; Springfield, 16th, 20th.

*Indiana.*—Indianapolis, 4th, 5th, 12th; Laconia, 4th; Logansport, 13th; New Harmony, 4th; Vevay, 4th, 13th, 25th.

*Iowa.*—Dubuque, 26th.

*Kansas.*—Fort Scott, 3d, 4th; Yates Centre, 16th.

*Kentucky.*—Louisville, 4th, 12th.

*Louisiana.*—Shreveport, 20th.

*Maine.*—Cornish, 20th; Eastport, 7th.

*Michigan.*—Detroit, 1st; Grand Haven, 26th.

*Missouri.*—Springfield, 20th.

*Montana.*—Fort Keogh, 25th.

*New York.*—Albany, 27th; Fort Columbus, 14th, 20th; New York City, 7th; Plattsburg Barracks, 21st.

*North Carolina.*—Charlotte, 9th; Weldon, 16th.

*Ohio.*—Bethel, 13th; Cincinnati, 4th, 8th; Cleveland, 19th, 26th; College Hill, 5th; Columbus, 8th, 28th; Portsmouth, 4th; Sandusky, 12th, 13th, 27th; Toledo, 12th, 13th.

*Oregon.*—Umatilla, 23d.

*Pennsylvania.*—Chambersburg, 13th, 19th; Philadelphia, 6th; Pittsburg, 13; West Chester, 6th; Williamsport, 17th.

*Rhode Island.*—Newport, 17th; Point Judith, 6th, 7th.

*Tennessee.*—Chattanooga, 1st; Nashville, 3d, 10th, 13th, 15th.

*Texas.*—Palestine, sleet fell from midnight of the 19th to 6.55 a. m. of 20th, covering the ground with ice to a thickness of four inches. Sleet also fell on the 1st; Brownsville, 21st, 22d; Fredericksburg, 2d; Galveston, 20th; New Ulm, 19th; San Antonio, 19th.

*Vermont.*—Burlington, 20th, 21st.

*Virginia.*—Chincoteague, 26th; Norfolk, 4th.

*West Virginia.*—Morgantown, 8th.

*Wisconsin.*—Madison, 26th; Milwaukee, 26th.

#### WINDS.

The most frequent directions of the wind during the month of January, 1883, for the Signal Service stations, are shown on chart iii., by arrows flying with the wind. In the lake region, they are from the west and southwest; in the extreme northwest, the upper Mississippi and Missouri valleys, they are from the northwest; in the southern states, they are generally from the north and northwest; along the Atlantic coast, they are from northwest to northeast; they are southerly in the north Pacific coast region, and generally from north and northwest in California.

#### TOTAL MOVEMENTS OF THE AIR.

[In miles.]

The following are the largest total movements at the Signal

Service stations: On the summit of Mount Washington, New Hampshire, 27,561; Delaware Breakwater, Delaware, 11,737; Sandy Hook, New Jersey, 11,727; Barnegat, New Jersey, 11,705; Block Island, Rhode Island, 11,598; Cheyenne, Wyoming, 11,183; Kittyhawk, North Carolina, 11,063; Indianola, Texas, 11,029; Hatteras, North Carolina, 10,976; Cape May, New Jersey, 10,886; Moorhead, Minnesota, 10,699; Rochester, New York, 10,301; Buffalo, New York, 10,261; Cape Mendocino, California, 10,077, (21 days); Sandusky, Ohio, 10,037; Champaign, Illinois, 9,929; Pike's Peak, Colorado, 9,538; Port Eads, Louisiana, 9,412; Grand Haven, Michigan, 9,206; Mackinac City, Michigan, 9,161; Eastport, Maine, 9,104; Marquette, Michigan, 9,071; Provincetown, Massachusetts, 8,997; Fort Sill, Indian Territory, 8,790; Saint Louis, Missouri, 8,783; Detroit, Michigan, 8,750; Oswego, New York, 8,725; Cape Henry, Virginia, 8,614; Fort Shaw, Montana, 8,431; Chincoteague, Virginia, 8,344; Erie, Pennsylvania, 8,225; Fort Assinibone, Montana, 8,216; Alpena, Michigan, 8,143; Fort Stevenson, Dakota, 8,137; Huron, Dakota, 8,017. The smallest are: Jacksonville, Florida, 1,853; Visalia, California, 1,862; Augusta, Georgia, 2,046; Roseburg, Oregon, 2,119; Silver City, New Mexico, 2,132; Salt Lake City, Utah, 2,333; Lynchburg, Virginia, 2,462; Lewiston, Idaho, 2,626; Tucson, Arizona, 2,640; Washington, District of Columbia, 2,675.

#### HIGH WINDS.

On the summit of Mount Washington, New Hampshire, velocities of 50 miles or more per hour occurred on all days during the month, with the exceptions of the following dates: 6th, 10th, 11th, 26th, 28th, 29th, 30th. The highest velocities recorded were as follows: 78, n.w., 1st; 88, n.w., 2d; 152, n.w., 3d (maximum for month); 136, n.w., 4th; 78, n.w., 5th; 78, n.w., 7th; 82, n.w., 8th; 82, n.w., 12th; 100, s.w., 13th; 96, n.w., 14th; 90, n.w., 15th; 80, w., 18th; 114, s.e., 20th; 116, w., 21st; 81, n.w., 22d; 100, n.w., 24th; 78, n.w., 25th; 81, n.w., 27th; 110, s., 31st.

On the summit of Pike's Peak, Colorado, the highest velocities were: 72, n.w., 2d (maximum for month); 64, n.w., 6th; 60, w., 7th; 52, n.w., 10th; 56, w., 11th; 60, w., 17th; 60, s.w., 18th. Records incomplete from 12th to 14th and 19th to 31st.

At Cape Mendocino, California, they were: 56, n.w., 17th; 58, n.w., 18th; 58, s.e., 23d; 100 (estimated), s.e., 24th (maximum for month); 70, s.e., 28th. Records incomplete from 1st to 9th, 25th, 26th.

At Fort Maginnis, Montana, on the morning of the 12th, a hurricane prevailed, and from 3 to 7 a. m. the average velocity was 76 miles per hour.

Other stations reporting velocities 50 miles or more per hour are as follows: Fort Keogh, Montana, 61, n.w., 29th; Indianola, Texas, 59, n., 8th; Fort Shaw, Montana, 58, s.w., 9th; Billings, Montana, 56, n.w., 12th; Duluth, Minnesota, 56, n.w., 10th; Rochester, New York, 56, w., 21st; Fort Stevenson, Dakota, 54, n.w., 9th; Barnegat, New Jersey, 52, n.e., 10th; Block Island, Rhode Island, 52, n.e., 10th; Cape Henry, Virginia, 52, n., 10th; Delaware Breakwater, Delaware, 52, n., 10th; Fort Assiniboine, Montana, 52, s.w., 8th; Fort Sill, Indian Territory, 52, n., 8th; Umatilla, Oregon, 52, n., 17th; Yankton, Dakota, 52, n.w., 13th; Buffalo, New York, 50, s.w., 21st; Moorhead, Minnesota, 50, n., 19th.

#### LOCAL STORMS.

New Orleans, Louisiana, 19th.—A severe thunder-storm prevailed here during last night, and was accompanied by a very heavy fall of rain. The streets were flooded and the planking torn up. The storm continued until 7.35 a. m.

San Francisco, California, 19th.—The very strong norther and high sea on the bay caused some damage to shipping interests in the northern part of the city. Brown's wharf at the foot of Mason street, was carried away; and a large lighter with two hundred and fifty tons of scrap-iron was capsized at the sea-wall. Several vessels were badly damaged by being driven against the wharves.

Fort Maginnis, Montana, 12th.—Hurricane from northwest

during the night. The wind attained an average velocity of seventy-six miles per hour from 3.00 to 7.00 a. m. Many buildings were unroofed or had their windows broken; much damage was caused by flying debris.

Cape Mendocino, California, 24th.—Very violent hurricane, the wind reaching an estimated velocity of one hundred miles per hour. The building was badly shaken, and anemometer cups were blown away.

Summit of Mount Washington, New Hampshire, 3d.—The wind increased to a violent hurricane, breaking off the anemometer at the dial. At the time the instrument was broken, a velocity of one hundred and fifty-two miles per hour was registered. It was impossible to replace the anemometer during the violence of the storm. In order to measure the rainfall, the observer was compelled to crawl to the rain-gauge, it being impossible to stand before the force of the wind. The storm continued during the 4th.

Oswego, New York, 21st.—During the early morning, the wind increased in force, attaining a velocity of forty-one miles per hour. The tin roof of a church was partly torn off, and the east wall of a mansard block, lately burned, was blown down. A few fences and trees were blown down. This storm occurred during the passage of low area xi.

Cheyenne, Wyoming, 29th.—Violent gale lasting eight hours; several buildings were more or less damaged. The wind attained a velocity of forty-nine miles per hour, filling the air with immense clouds of dust. The storm occurred during the passage of low area xvi.

#### VERIFICATIONS.

##### INDICATIONS.

The detailed comparison of the tri-daily indications for January, 1883, with the telegraphic reports for the succeeding twenty-four hours, shows the general average percentage of verifications to be 89.59 per cent. The percentages for the four elements are: Weather, 91.16; direction of the wind, 87.05; temperature, 90.90; barometer, 89.09 per cent. By geographical districts, they are: For New England, 89.93; middle Atlantic states, 90.60; south Atlantic states, 90.76; eastern Gulf, 90.40; western Gulf, 89.03; lower lakes, 89.51; upper lakes, 88.30; Ohio valley and Tennessee, 89.81; upper Mississippi valley, 90.08; Missouri valley, 87.79; north Pacific, 70.59; middle Pacific, 93.18; south Pacific, 93.18.

There were one hundred and twenty-one omissions to predict (thirty-two being due to the absence of reports from the Pacific coast,) out of 3,813, or 3.28 per cent. Of the 3,692 predictions that have been made, ninety-three, or 2.51 per cent., are considered to have entirely failed; forty-nine, or 1.35 per cent., were one-fourth verified; two hundred and seventy-four, or 7.42 per cent., were one-half verified; four hundred and seventy-one, or 12.75 per cent., were three-fourths verified; 2,805, or 75.97 per cent., were verified, so far as can be ascertained from the tri-daily reports.

#### CAUTIONARY SIGNALS.

During January, 1883, one hundred and twenty-seven cautionary signals were displayed; of these, one hundred and four, or 81.1 per cent., were justified by winds of twenty-five miles or more, per hour, at or within one hundred miles of the station. Twenty cautionary off-shore signals were displayed; of these, fifteen, or 75.0 per cent., were fully justified, both as to direction and velocity; twenty, or 100 per cent., were justified as to direction, but not as to velocity. Two cautionary north-west signals were ordered, but were not justified either as to velocity or direction. One hundred and forty-nine signals of all kinds were displayed, of which one hundred and nineteen, or 79.87 per cent., were fully justified. Twenty-two signals were changed from cautionary to cautionary off-shore, and six signals were ordered late. The above numbers do not include signals ordered at sixty-nine display stations, where the velocity is only estimated.

One hundred and two cases of winds of twenty-five miles or more per hour were reported, for which no signals were ordered; most of these were high local winds or strong sea-breezes.